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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/781,786

02/20/2004

Mitsutoshi Higashi

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04/15/2005

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EXAMINER

TSUKERMAN, LARISA Z

ART UNIT

PAPER NUMBER

2833

DATE MAILED: 04/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No. **10/781,786**

Applicant(s)

HIGASHI, MITSUTOSHI

Examiner

Larisa Z. Tsukerman

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 12 January 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☒ Claim(s) 11-13 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

Upon reconsideration the Examiner has withdrawn allowance of claim 8.

The rejection on the merits as found bellow.

### ***Claim Objections***

Claim 8 is objected to because of the following informalities: in line 2, after "device" insert – comprising --.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Khandros et al. (6442831).

**In regard to claim 1**, Khandros et al. disclose a semiconductor device comprising:

a substrate body 212;

a plurality of external contact terminals 200 formed of springy wires arranged on and extending from the substrate body 212;

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each of the external contact terminals 200 having a base end 216a connected to the substrate body 212 and a tip end 216b apart from the base end; and

each of the external contact terminals 200 being plated, at least, or the tip end thereof with multiple-layered films 220 (Au) and 218 (Ni) comprising a plurality of successively plated layers, including a first layer **which can be** dissolved by a first etching agent but is not reactive to a second etching agent, and a second layer which can be dissolved by the second etching agent but is not reactive to the first etching agent.

**It is inherent** that some metals or alloys are dissolved by some etching agent (acid), and some metals or alloys are indifferent to the same acid.

**Claims 4, 7 and 9** are rejected under 35 U.S.C. 102(b) as being anticipated by Chang et al. (6168974).

Chang et al. disclose a semiconductor device comprising:

a substrate body 274;

a plurality of external contact terminals 270 formed of springy wires, the external terminals 210 arranged on and extending from the substrate body 274;

each of the external contact terminals having a base end (not marked, analog to 216a) connected to the substrate body 274 and a tip end apart from the base end (not marked, analog to 216b);

an **insulating resin** layer 272 (see claim 12) formed on the substrate body 274 in such a manner that at least a portion including the tip end extending from the insulating resin layer is exposed; and

each of the external contact terminals 270 being plated, in at least the exposed portion thereof, with a multiple-layered film 282 and 284 comprising a plurality of successively plated layers, including a first layer, which **can be** dissolved by a first etching agent but is not reactive to a second etching agent, and a second layer which **can be** dissolved by the second etching agent but is not reactive to the first etching agent.

**It is inherent** that some metals or alloys are dissolved by some etching agent (acid), and some metals or alloys are indifferent to the same acid.

**In regard to claims 7 and 9**, Chang et al. disclose the insulating resin is an elastomeric material (silicone rubber).

**Claims 8 and 10** are rejected under 35 U.S.C. 102(b) as being anticipated by Applicant own admission of Prior Art.

**In regard to claims 8 and 10**, Applicant discloses on pages 2-3 of Specification a method of using a semiconductor device, the device comprising a substrate body; a plurality of external contact terminals formed of springly wires, the external terminals arranged on and extending from the substrate body; each of the external contact terminals having a base end connected to the substrate body and a tip end apart from the base end; and each of the external terminals being plated with multiple films which are removable by an **etching treatment**; the method comprising:

removing the plated film by an etching treatment in accordance with a degree of contamination of the tip end; and

rinsing this semiconductor device to reuse the same.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claim 2** is rejected under 35 U.S.C. 103(a) as being unpatentable over Khandros et al. (6442831) in view of Lee et al. (6469386).

Khandros et al. disclose the springy wire 216 is formed of gold, and the multiple-layered films comprise a nickel 218 or nickel alloy film formed on the surface of the wire 216, and a gold film 220, but lack a **palladium** film formed in succession thereon. Lee et al. teach a palladium and gold are successionaly plated to form an outermost layer. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made and **for better soldering** to include outermost layer of a palladium and gold as taught by Lee et al. in structure of Khandros et al.

**Claim 3** is rejected under 35 U.S.C. 103(a) as being unpatentable over Khandros et al. (6442831) and Lee et al. (6469386), as applied to claim 2 above, and further in view of Chua et al. (6439898)

Khandros et al. and Lee et al. disclose the springy wire 216 is formed of gold, and the multiple-layered films comprise a nickel or nickel alloy film 218 formed on the surface of the wire 216, and a gold film 220, but lack a **indium film** formed in succession thereon. Chua et al. teach an **alternative equivalent** method to cover a contact preferably with a conductive and preferably inert material such as **palladium or indium**. Therefore, it

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would have been obvious to one having ordinary skill in the art at the time the invention was made to include outermost layer of a palladium and indium, **as alternative equivalent**, as taught by Chua et al. in structure of Khandros et al.

**Claim 5** is rejected under 35 U.S.C. 103(a) as being unpatentable over Chang et al. (6168974) in view of Lee et al. (6469386).

Chang et al. disclose the springy wire 280 is formed of gold, and the multiple-layered films comprise a nickel 284 or nickel alloy film formed on the surface of the wire 280, and a gold film (not shown, see Col.19, line 47-490), but lack a **palladium** film formed in succession thereon. Lee et al. teach a palladium and gold are plated to form an outermost layer. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made and for the same reason to include outermost layer of a palladium and gold as taught by Lee et al. in structure of Chang et al. for better soldering.

**Claim 6** is rejected under 35 U.S.C. 103(a) as being unpatentable over Chang et al. (61689747) and Lee et al. (6469386), as applied to claim 5 above, and further in view of Chua et al. (6439898)

Chang et al. and Lee et al. disclose the springy wire 280 is formed of gold, and the multiple-layered films comprise a nickel or nickel alloy film 284 formed on the surface of the wire 280, and a gold film (not shown, see Col.19, line 47-490), but lack a **indium film** formed in succession thereon. Chua et al. teach an **alternative equivalent** method to cover a contact preferably with a conductive and preferably **inert material** such as **palladium or indium**. Therefore, it would have been obvious to one having ordinary

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skill in the art at the time the invention was made to include outermost layer of a palladium and indium (**alternative equivalents**) as taught by Chua et al. in structure of Chang et al.

***Allowable Subject Matter***

Claims 11 - 13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is an examiner's statement of reasons for allowance:

Regarding claims 11 - 13, Prior Art of record does not teach or suggest a method of using a semiconductor device having external contact terminals being plated with multiple-layered films comprising a plurality of successively plated layers, that particularly characterized by an outermost layer of the successively plated layers is dissolvable by a first etching agent but is not reactive to a second etching agent and a next most outermost layer is dissolvable by the second etching agent but is not reactive to the first etching agent, using the first etching agent to remove the outermost layer; and when the first outmost layer has been selectively removed by the first etching agent, removing the next most outmost layer by using the second etching layer.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."



**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Larisa Z. Tsukerman whose telephone number is (571)-272-2015. The examiner can normally be reached on Monday through Friday from 8:30 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paula A. Bradley can be reached on (571)-272-2800 ex. 33. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LT  
03/28/2005

  
ROSS GUSHI  
PRIMARY EXAMINER